

**Survey Data report:
Defining “Resilient Landscapes” From Multiple Stakeholder Perspectives
in a Wildland Urban Interface (WUI) Area**

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Intent:

The wildland urban interface (WUI) is a pressing concern for fire, fuels, and other land managers. The intermixing of residences within and adjacent to public lands puts lives and properties at risk of wildfire-related damage and losses. The presence of citizens and property in WUI areas amplifies the importance of conducting preventative land management activities to reduce risks and generate a resilient landscape. And yet, land and fuels treatments in WUI areas are often highly visible, which subjects them to public scrutiny, and in some cases, opposition. When agencies and their stakeholders are not able to reach adequate consensus regarding the definition of “resilient landscapes” and how to support them, fuel treatment projects may be incompletely executed or even blocked, preventing important land and fuels management activities intended to reduce wildfire risk.

The data described here are the result of a project funded by the Joint Fire Sciences Program (project ID: 16-3-01-37). This project builds on and extends the findings from a previous project carried out in 2014-2015, led by Toman and colleagues (Joint Fire Science Program, project ID: 12-2-01-59). Toman’s project was a cognitive mapping effort that revealed that formal stakeholders in the western Boulder County area shared a high level of alignment in their characterization of the challenges of and appropriate pathways to support healthy and resilient forests (Toman, Brenkert-Smith, Curtis, Rogers, & Stidham, 2015). Toman’s project, however, did not engage the public, nor did it focus on any specific past or planned fuels treatment effort. Hence, this project directly extends previous efforts by focusing on a specific project approved for implementation, the Forsythe II project (<https://www.fs.usda.gov/detail/arp/landmanagement/projects/?cid=STELPRD3846763>). The main goal of this research effort is to better understand how residents in the areas most directly affected by the proposed fuels treatments characterize *resilient landscapes* and their perspectives on the work planned for Forsythe II.

Survey Administration:

Originally, this research effort included a plan to administer a household survey to approximately 200 participants along the Front Range. At that time, the focus was intended to capture public views on forest resilience at a conceptual level and across a broad space. Focus groups and interviews with residents in areas near the planned Forsythe II treatments, however, highlighted what appeared to constitute a significant and seemingly unbridgeable barrier between the work plan and those who fiercely opposed implementation. It became imperative to change the planned approach to survey administration in order to answer the emergent question: *To what extent is the fierce opposition being heard in the focus groups, interviews, and in public forums representative of the broader population in the Forsythe II area?* As such, we amended the survey administration plan to conduct a census of households in the zipcode area for the Nederland community (80466).

The research team crafted a survey based on research literature, data from the qualitative portions of the study, and input from local leaders. The survey instrument was accompanied by a cover letter to provide background on the study and co-signed by representatives from a range of organizations in the hopes of ensuring broad public participation. Co-signers included Jim Webster (Boulder County Wildfire Partners), Rick Dirr (Chief of the Nederland Fire Department), Kristopher Larsen (Mayor of the Town of Nederland), and Vivian Long (Magnolia Forest Group).

Data collection was initiated at the end of September 2017 (See details in Table 1). First, letters of invitation were mailed to on 24 September 2017 with a two-dollar token of appreciation to 2171 households. This letter introduced the study and invited residents to participate in the survey online.

On 19 October 2017, after having culled bad addresses (274) and early respondents (134) from the list, a second mailing was sent to 1763 residents. This time, the mailing was a packet that included a cover letter, a paper version of the survey, and a postage-paid return envelope. A second survey packet was mailed on 9 November 2017 to those who had yet to respond (1576). A final mailing was conducted on 21 November 2017, for which half the remaining non-respondents were mailed a letter with the weblink (685) and the other half of the non-respondents were mailed a letter with a weblink, along with a paper survey and return envelope (685).

Table 1. Mailing strategy to every household within 80466 zipcode

	Dates	Numbers mailed
Initial letter – web link + \$2 incentive	9/24/2017	2171 (1897 delivered)
Packet 1 – survey packet & web link	10/19/2017	1763
Packet 2 – survey packet & web link	11/9/2017	1576
Final mailing A – web link	11/21/2017	685
Final mailing B – survey packet & web link	11/21/2017	685

A total of 637 households are represented in the response, an approximately 33.5% response rate. Well over half (63.11%) were conducted via a web-based survey, while 36.89% completed the survey with a traditional mail-in paper survey.

Respondents:

The vast majority of respondents (94%) are full-time residents, occupying their home 12 months of the year, and 88% own their own home. Almost a third (32%) of respondents are long-time residents, having move to their current residence before 1998. Importantly, almost a quarter (24%) arrived between 2013 - 2017 while the remaining 45% are spread relatively evenly across the years between 1998 and 2012 (see Table 2).

Table 2. Length of tenure of respondents (n= 633)

Year of move to current residence	Number of respondents	Percent of respondents
1916-1997	200	32%
1998-2002	86	14%
2003-2007	88	14%
2008-2012	106	17%
2013-2017	153	24%

Just under half the survey respondents are female (46%) and most are highly educated with 20% having reported having had some college or technical school training, 39% reporting being a college graduate and another 38% reporting having had some postgraduate training. Over half (53%) of respondents are employed full time and 12% are employed part-time. Almost a third (31%) are not currently employed and not looking, which we assume are a combination of retirees and homemakers. Finally, survey respondents report a relatively high level of income, with approximately 48% of respondents reporting a household income of \$90,000 or more, however a full 10% of respondents reported a household income of less than \$30,000 (see abbreviated data in Table 3).

Table 3. Reported household income of respondents (n=581)

2016 Household income before taxes	Number of respondents	Percentage of respondents
No answer	56	
Less than 30k	57	10%
30k-60k	113	20%
60k-90k	127	22%
90k-120k	108	18%
120k+	176	30%

Results:

A meaningful landscape

At the outset of the research study, we sought to better understand how residents understood and characterized their relationships to the landscape. Overall, we see that the vast majority of respondents report strong attachments. Eighty-five percent of respondents agreed or strongly agreed with the statement “I feel the public land surrounding Nederland is a part of me.” Likewise, 88% of respondents agreed or strongly agreed with the statement “When I spend time in the public lands surrounding Nederland, I feel a deep sense of one-ness with the natural environment. Along with this strong personal connection to the landscape, residing in close proximity allows for engaging in desirable activities. As such, 81% reported that they agreed or strongly agreed that the public land surrounding Nederland “is the best place for what I like to do.” Importantly, this connection to the landscape may be related to further characterization of local public lands that was echoed repeatedly in the focus groups and interviews conducted and reflected in the 87% of respondents who agreed or strongly agreed that “the public lands surrounding Nederland to be a part of my “backyard.”

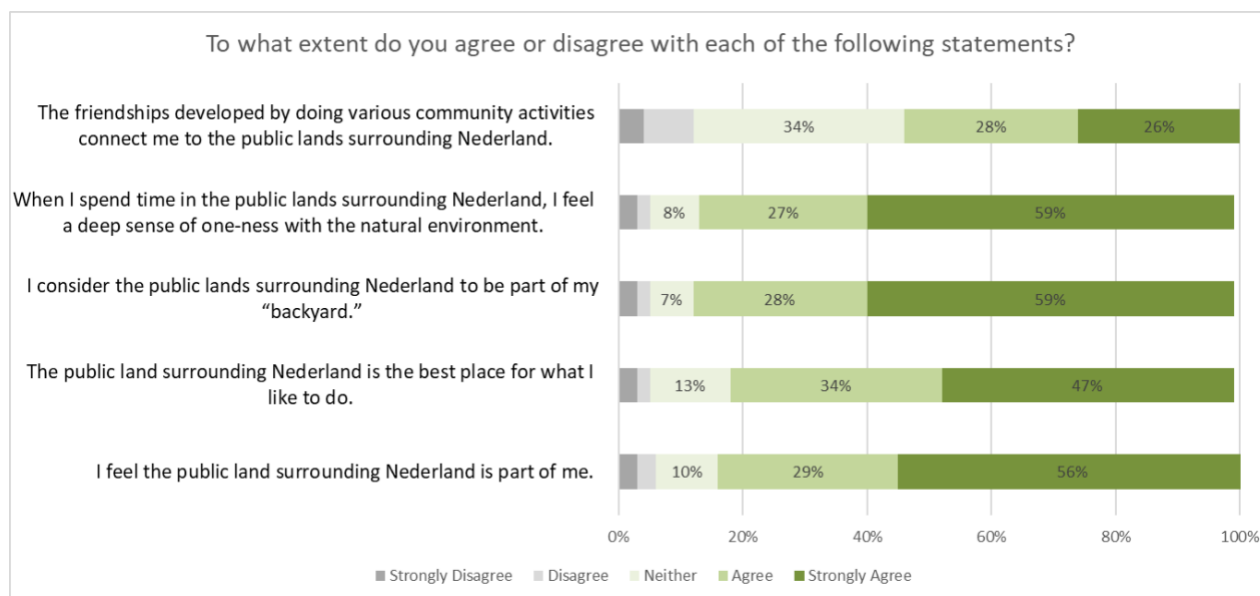


Table 4. Attachment to place measures

It is notable, however, that despite the fact that many focus group/interview participants reflected on the importance of social ties that are fostered while engaging in activities on public lands (e.g. sharing walks, interacting with community members), only 57% of respondents agreed or strongly agreed that the “friendships developed by doing various community activities connect me to the public lands surrounding Nederland.”

It is clear that respondents experience a strong connection to local public lands. When asked about how such connections may change if there were a disruption to that landscape, we see interesting results. Almost half reported that their attachment to the public lands surrounding Nederland would remain the same after a large wildfire (46%) and after fuel treatment activities (49%). We see that some reported that attachment would be stronger after a wildfire (39%) and after fuel treatment activities (26%). Only, 16% reported that their attachment would be weaker or much weaker after a wildfire, though a quarter (25%) anticipated that their attachment would be weaker or much weaker after fuel treatment activities. In other words, overall respondents didn’t anticipate very much change to their attachment due to disruptions to the landscape, but some residents did anticipate some change.

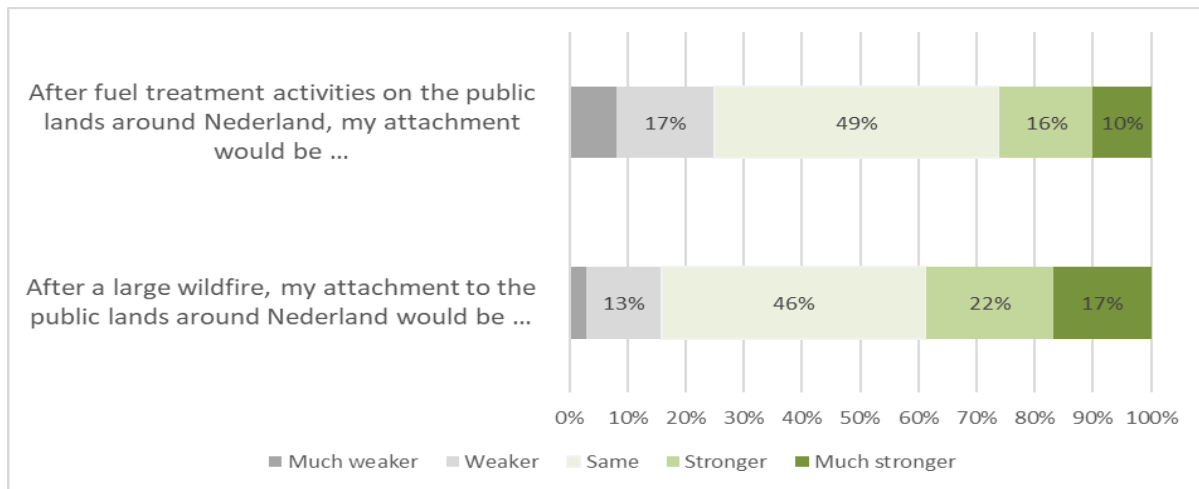


Table 5. Effect of landscape changes on place attachment

The Wildland-Urban Interface: A safe place for human habitation and support healthy forest processes

Despite indications that some respondents anticipate a weakened attachment to a landscape with fuel treatments, we see broad support for fuel treatment activities. Specifically, we asked about a range of types of activities and ... “[h]ow do the following activities contribute to making the wildland-urban interface (WUI) a safe place for human habitation, and support what you *understand* to be healthy forest processes.” We see that respondents indicate that they believe that citizens thinning fuels on their properties and having the ability to thin on adjacent public lands, as well as land management agencies thinning, using prescribed burning, and allowing wildfire to burn on public lands would support healthy forest processes. While there is less support for the use of patch cuts to support such processes, over half still support these practices.

Responses on the extent to which the same practices make the WUI a safe place for human habitation varied. Respondents generally reported that citizens thinning fuels on their own properties, having the ability to thin on adjacent public lands, and land management agencies thinning on public lands supports making the WUI safe. While there was less support for land management agencies to engage in patch cuts and prescribed burning, there was still broad support among respondents. The practices that respondents indicated the least support was for land management agencies allowing wildfire to burn on public lands. However, despite lower support, over a third (34%) support this practice and another third (32%) selected a middle, neutral response indicating neither support nor opposition to the practice.

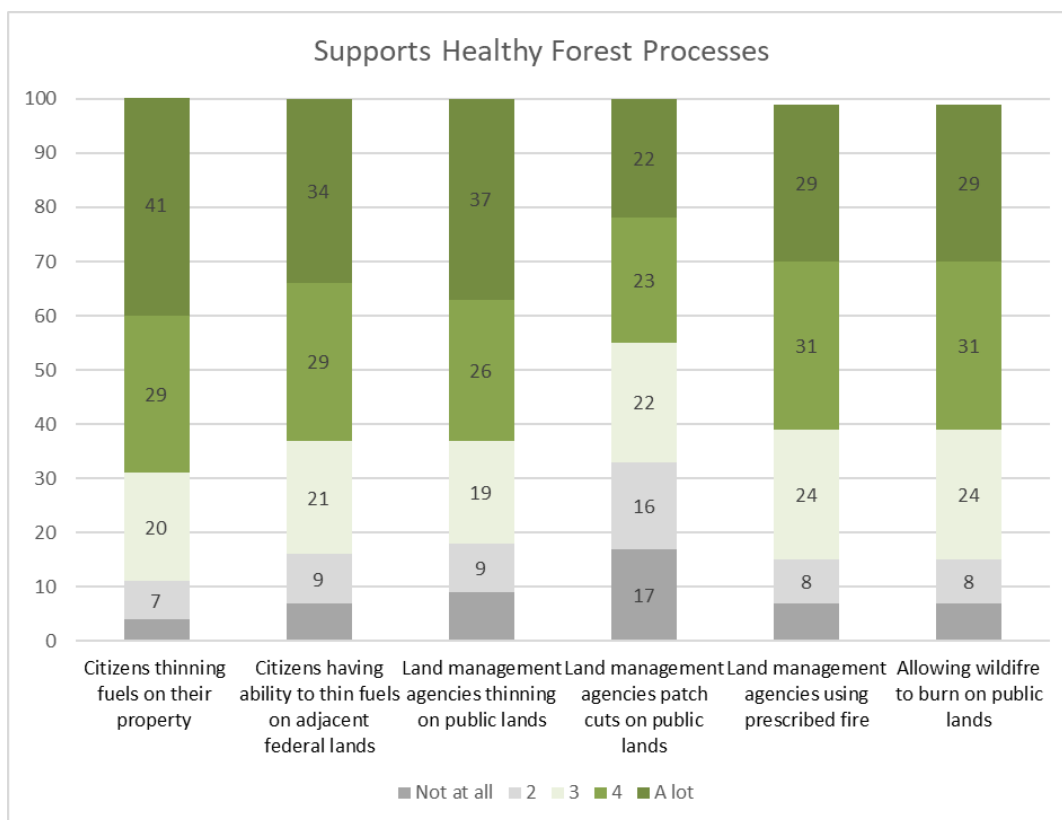


Table 6. How do the following practices support what you *understand* to be healthy forest processes?

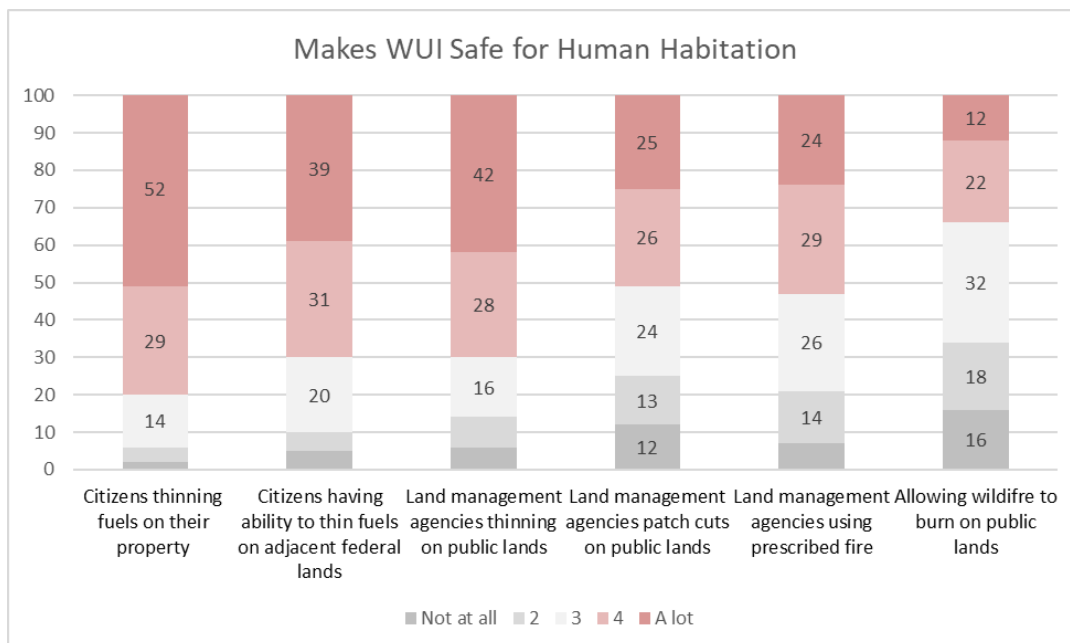


Table 7. How do the following activities contribute to making the wildland-urban interface (WUI) a safe place for human habitation?

Attitudes about USFS

When asked, “as of today, how strongly do you support or oppose the Forsythe II fuels treatment project proposed by the USFS,” we see almost a third (31%) of the survey respondents report supporting the Forsythe II project. Likewise, we see almost a third (27%) who indicate opposition. Notably, the same portion (28%) report either not being sure of their opinion or not knowing whether or not they support the project. Also of note, just over a fifth (14%) who responded selected a neutral position.

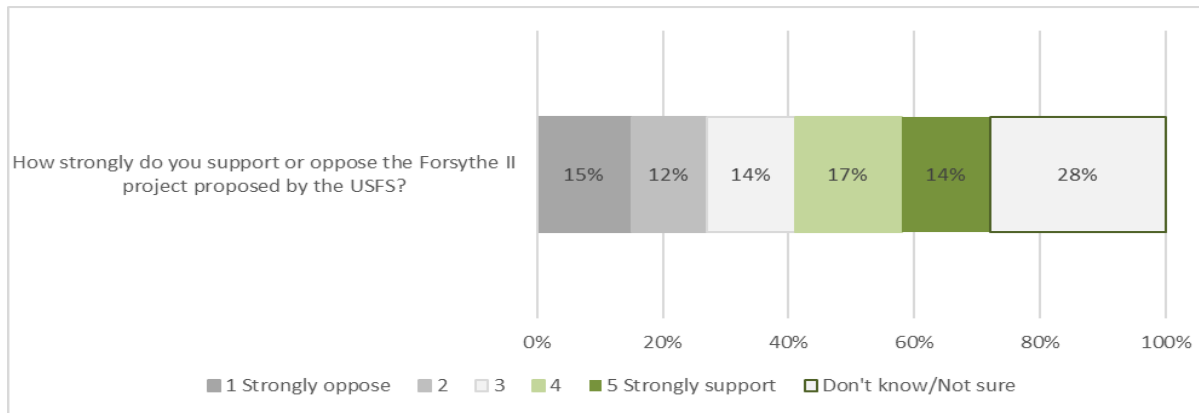


Table 8. Overall support/opposition to Forsythe II

When asked how respondents’ opinions have changed regarding the Forsythe II project since first hearing about it, we see that 40% of respondents indicate that their opinion of the proposed project has not changed. Over a third (38%) report having somewhat or a lot more favorable opinions about the planned work and less than a quarter (22%) reported less or a lot less favorable opinions.

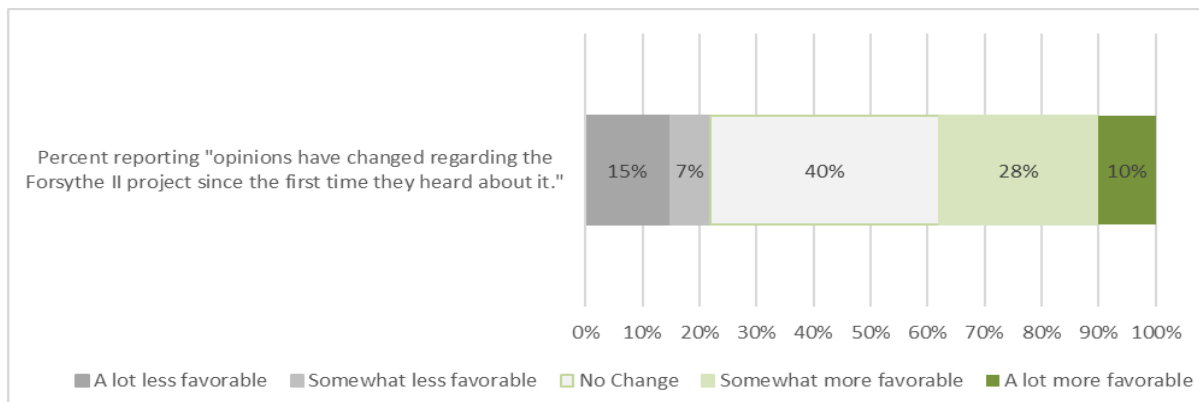


Table 9. Opinion change of Forsythe II

When asked how often USFS made changes to the Forsythe II project plans in response to community members’ input, we see that the majority of respondents indicated they didn’t know (67%). A small portion of respondents (16%) reported that they thought the USFS rarely or never made changes to project plans based on community members’ input. Likewise, 16% report that such changes occurred often or sometimes.

Notably when asked about whether respondents had participated in public participation in forums to express views about the Forsythe II project, 38% reported never having participated and nearly a fifth

(18%) reported having rarely participated. Another fifth (19%) of respondents reported that the question was not applicable to them. In other words, over 75% of survey respondents have either never or rarely participated in any type of public forum in which they had an opportunity to voice their opinion, or considered such forums not applicable.

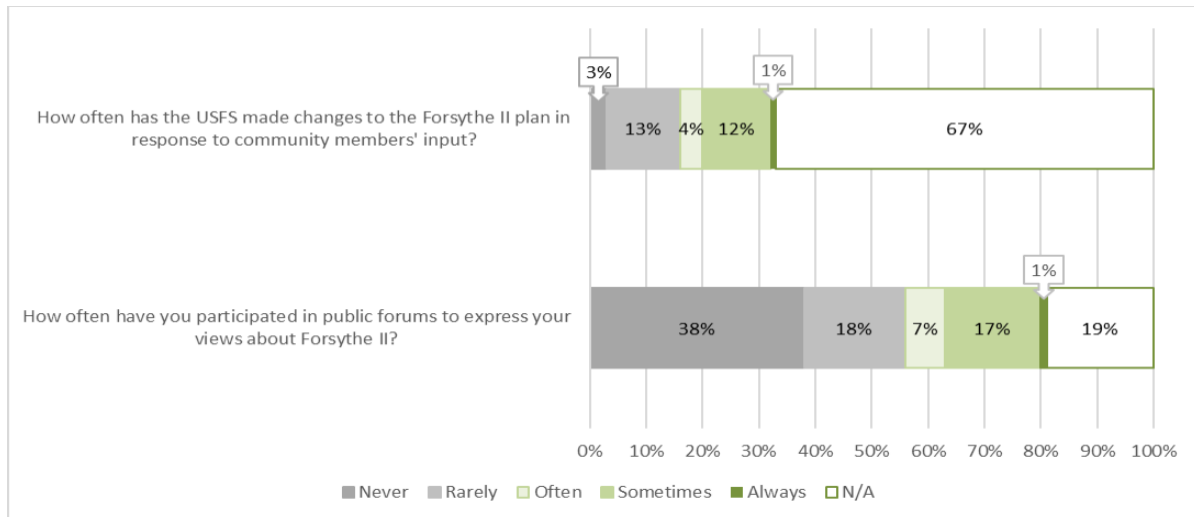


Table 10. Change to Forsythe II & Participation in public processes

Contributors to wildfire damage

When asking respondents to reflect on factors contributing to the chance of wildfire damaging your property in the next five years, we see that more than three quarters of respondents (77%) report that human activity (e.g. accidental ignition, campfires) was a major contributor to that chance. Thirty-three percent of respondents reported that weather-related natural starts constitute a major contributor. We see that respondents identify contributors to the risk to their property as other factors beyond their own parcel's conditions, with 31% reporting that vegetation on public lands and 27% identifying vegetation on their neighbors' properties as major contributors. When reflecting on their own property's contribution to the risk they face, 25% of respondents identify vegetation on their own property as a major contributor and 20% identify the physical characteristics of your property other than vegetation, such as steep inclines, as a major contributor. Fewer, 18% of respondents identify the characteristics of their house or other buildings on their property as a major contributor.

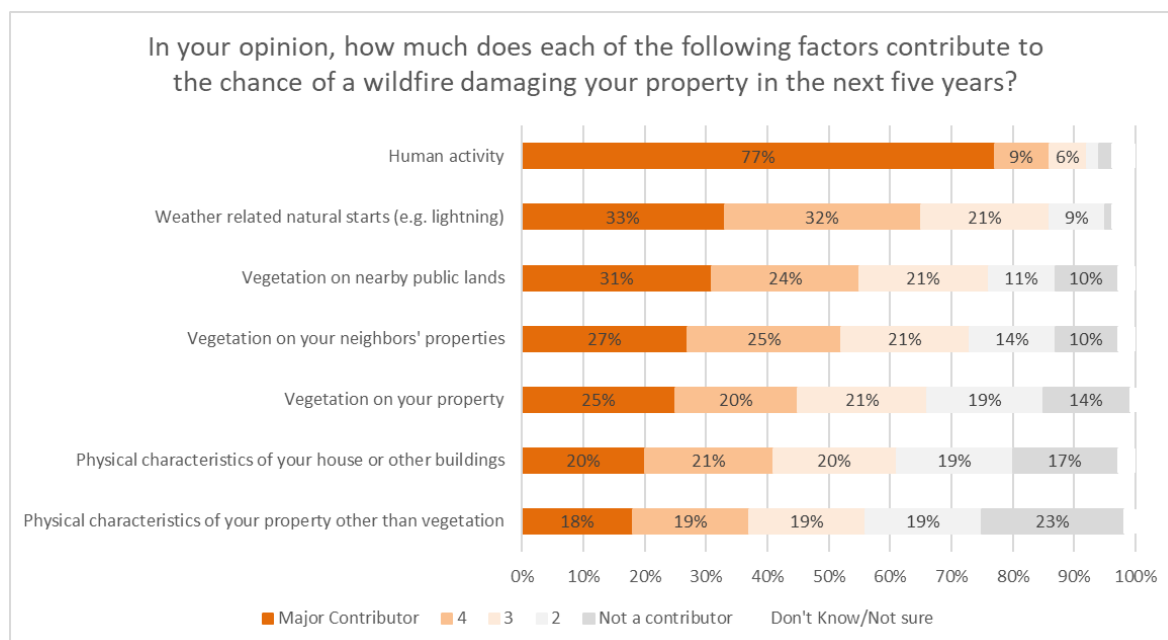


Table 11. Factors contributing to chance of wildfire damage

Mitigation activities

When asked about action respondents had taken to reduce the risk of wildfire to their residence, we see that 87% have reduced vegetation within 100 feet of their home and 89% report having reduced other combustible items from within 30 feet of their home. Not surprisingly (and consistent with other studies), notably fewer reported (37%) reported having changed exterior building materials to something less combustible. Notably, 30% of respondents reported having had their property assessed by Boulder County Wildfire Partners. Fifty-three percent of respondents reported having taken other risk reducing steps, though the survey did not capture those activities.

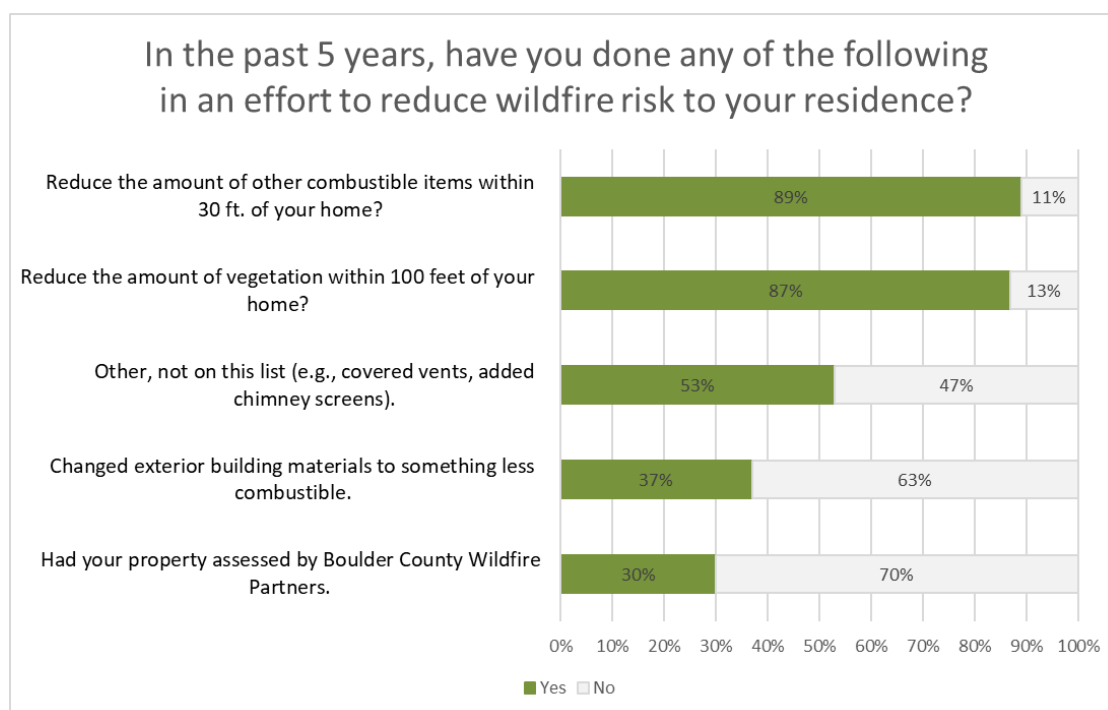


Table 12. Actions to reduce risk

In the event of a wildfire

Respondents were asked to consider what might occur if a wildfire reached their property. Forty-five percent reported that a firefighter would protect their home and only 19% reported that it was very likely that their home would be damaged or destroyed. Forty-two percent reported that it was very likely that their trees and landscape would burn.

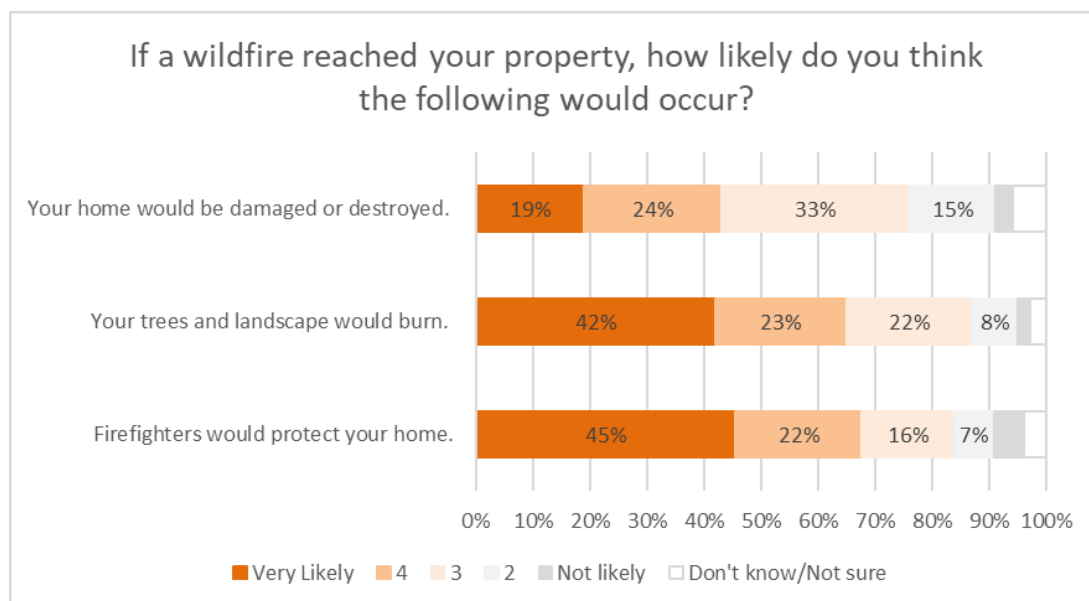


Table 13. Likely outcomes in the event of a wildfire

Conclusions

The intent of this study was to help illuminate local understandings of forest resilience and perspectives on the USFS's Forsythe II project. The focus of the reporting here, on the quantitative survey data collected from the area most affected by the past treatments and future planned activities are critical. They demonstrate several important findings. Not surprisingly, those who live adjacent to and near public lands report a strong sense of attachment. Indeed, the natural landscapes provided by public lands support important and meaningful connections to the natural world.

Overall, respondents indicate support for fuels treatments for both the support of healthy forest processes and to reduce risk within the wildland-urban interface. When asked specifically about the Forsythe II project, respondents fell into roughly three even groupings: those who support the project (31%), those who oppose the project (27%), and those who are generally neutral or unaware of the project (42%). In the time since the initial proposals of the project, the USFS has held numerous opportunities for public comment and feedback. We see that after these activities, 40% report that their views of the project have remained unchanged, while 38% report a more favorable view and 22% report a less favorable view. We also see that for the most part, respondents have not engaged in the public processes available to them. Over half (56%) have rarely or never participated in such opportunities.

Given the numerous opportunities available to engage in public comment processes and the fact that most residents indicate general support for fuels treatments activities, we interpret neutral responses and lack of engagement as implicit support for activities planned by and carried out by land management agencies. As such, the data appear to indicate overall public sentiment of the population most directly affected by the planned activities as supportive of the planned activities of the Forsythe II project.